

IN THE CLAIMS:

Please amend the claims as follows.

1. (Cancelled)

2. (Currently Amended) The method of claim 4 45, wherein the at least one parameters ~~further~~ comprises at least one selected from the group consisting of a performance parameters, an environment parameters, and a simulation parameters.

3. (Currently Amended) The method of claim 2, wherein the performance parameter[[s]] comprise drilling parameters.

4. (Currently Amended) The method of claim 2, wherein the environment parameter[[s]] comprises cutting element interaction data and bottom hole geometry data.

5. (Currently Amended) The method of claim 4 45, wherein the ~~executing the simulation determining the radial forces~~ comprises:

rotating the selected drill bit;

calculating a new location of a cutting element on the selected drill bit;

determining ~~the~~ an interference between the cutting element and ~~the~~ an earth formation[[s]] at the new location; and

calculating a radial force acting on the earth formations based on the interference at the new location.

6. (Currently Amended) The method of claim 4, wherein the selected drill bit is a roller cone drill bit.

7. (Currently Amended) The method of claim 6, wherein the bit design parameters of the selected drill bit comprise[[s]] at least one of a selected from the group consisting of a cone profile, a cone axis offset, a number of cutting elements on each cone, a location of a cutting element of the selected drill bit, a size of a cutting element of the selected drill bit, a shape of a cutting element of the selected drill bit, and an orientation of a cutting element of the selected drill bit.

8. (Currently Amended) The method of claim 4, wherein the selected drill bit is a fixed cutter drill bit.

9. (Currently Amended) The method of claim 8, wherein the bit design parameters of the selected drill bit comprise[[s]] at least one of a selected from the group consisting of a cutter location, a cutter orientation, a cutter size, a cutter shape, and a cutter bevel

size, a bit profile, a bit diameter, a number of blades on the selected drill bit, a blade geometry, a blade location, a junk slot area, and a bit axial offset.

10. (Currently Amended) The method of claim 1 45, wherein the applying the criterion to evaluating the radial forces comprises:

summing [[a]] magnitudes of the radial forces with respect to the a direction to generate a sum of the radial forces;
comparing the sum of the radial forces to an applied weight-on-bit; and
generating a ratio between the sum of the radial forces and the applied weight-on-bit.

11. (Original) The method of claim 10, wherein the ratio of the sum of the radial forces to the applied weight-on-bit is no more than about 0.20.

12. (Original) The method of claim 10, wherein the ratio of the sum of the radial forces to the applied weight-on-bit is no more than about 0.10.

13. (Original) The method of claim 10, wherein the ratio of the sum of the radial forces to the applied weight-on-bit is no more than about 0.05.

14. (Currently Amended) The method of claim 14, wherein the ~~applying the criterion evaluating the radial forces~~ comprises:

plotting [[a]] magnitudes of the radial forces with respect to at least one selected from [[a]] ~~the group consisting of a direction of force, a frequency of occurrence, and time~~, to generate a radial force plot.

15. (Currently Amended) The method of claim 14, wherein the radial force plot comprises a polar plot of the magnitudes and directions of the resultant radial forces.

16. (Currently Amended) The method of claim 15, wherein the polar plot indicates that the resultant radial forces ~~is are~~ less than a predetermined value for a selected percentage of the time during the simulated drilling.

17. (Currently Amended) The method of claim 16, wherein the selected percentage of the time during the simulated drilling is 70%.

18. (Currently Amended) The method of claim 14, wherein the radial force plot comprises a chart plot of the resultant radial force.

19. (Currently Amended) The method of claim 18, wherein the polar chart plot indicates that the radial resultant forces is are less than a predetermined value for a selected percentage of the time during the simulated drilling.
20. (Currently Amended) The method of claim 19, wherein the selected percentage of the time during the simulated drilling is 70%.
21. (Currently Amended) The method of claim 14, wherein the radial force plot comprises a box-whisker plot of the resultant radial forces.
22. (Currently Amended) The method of claim 21, wherein the polar box-whisker plot indicates that the resultant radial forces is are less than a predetermined value for a selected percentage of the time during simulated drilling.
23. (Currently Amended) The method of claim 22, wherein the selected percentage of the time during the simulated drilling is 70%.
24. (Canceled)

25. (Currently Amended) The method of claim 24 46, wherein the ~~applying the criterion to evaluating the radial forces~~ comprises:

summing a magnitude of the radial forces with respect to the direction to generate a sum of radial forces;
comparing the sum of radial forces to an applied weight-on-bit; and
generating a ratio between the sum of the radial forces and the applied weight-on-bit.

26. (Currently Amended) The method of claim 24 46, wherein the ~~applying the criteria to evaluating the radial forces~~ comprises:

plotting a magnitude of the radial forces with respect to at least one selected from a group of direction of force, frequency of occurrence, time, to generate a radial force plot.

27. (Currently Amended) The method of claim 26, wherein the radial force plot comprises a polar plot of the magnitudes and directions of the resultant radial forces.

28. (Currently Amended) The method of claim 27, wherein the polar plot indicates that the resultant radial forces is are less than a predetermined value for a selected percentage of the time during the simulated drilling.

29. (Currently Amended) The method of claim 28, wherein the selected percentage of the time during the simulated drilling is 70%.

30. (Currently Amended) The method of claim 26, wherein the radial force plot comprises a chart plot of the resultant radial force.

31. (Currently Amended) The method of claim 30, wherein the polar chart plot indicates that the radial resultant forces is are less than a predetermined value for a selected percentage of the time during the simulated drilling.

32. (Currently Amended) The method of claim 31, wherein the selected percentage of the time during the simulated drilling is 70%.

33. (Currently Amended) The method of claim 26, wherein the radial force plot comprises a box-whisker plot of the resultant radial forces.

34. (Currently Amended) The method of claim 33, wherein the polar box-whisker plot indicates that the resultant radial forces is are less than a predetermined value for a selected percentage of the time during simulated drilling.

35. (Currently Amended) The method of claim 34, wherein the selected percentage of the time during the simulated drilling is 70%.

36. (Currently Amended) The method of claim 24 46, further comprising adjusting bit design parameters.

37. (Currently Amended) The method of claim 36, wherein the drilling tool bottomhole assembly comprises a roller cone drill bit; and wherein the bit design parameters comprise at least one of a group consisting of a cone profile, a cone axis offset, a number of cutting elements on each cone, a location of a cutting element of the drill bit, a size of a cutting element of the drill bit, a shape of a cutting element of the drill bit, and an orientation of a cutting element of the drill bit.

38. (Currently Amended) The method of claim 36, wherein the drilling tool bottomhole assembly comprises a fixed cutter drill bit; and wherein the bit design parameters comprise at least one of a group consisting of a cutter location, a cutter

orientation, a cutter size, a cutter shape, and a cutter bevel size, a bit profile, a bit diameter, a number of blades on the bit, a blade geometry, a blade location, a junk slot area, and a bit axial offset.

39. (Canceled)

40. (Currently Amended) The method of claim ~~39~~ 46, wherein the graphically displaying occurs in real time.

41. (Canceled)

42. (Currently Amended) A drill bit designed using the method of claim ~~4~~ 45.

43. (Currently Amended) A bottomhole assembly designed using the method of claim ~~24~~ 46.

44. (Canceled)

45. (New) A method for designing a drill bit, comprising:

determining radial forces acting on a selected drill bit during simulated drilling;

evaluating the radial forces based on at least one selected criterion; and

adjusting at least one parameter of the selected drill bit based on the evaluation evaluating.

46. (New) A method for designing a bottomhole assembly, comprising:

determining radial forces acting on a bottom hole assembly during simulated drilling, said bottomhole assembly including a drill bit;

evaluating the radial forces based on at least one selected criterion; and

adjusting at least one parameter of the bottom hole assembly based on the evaluation.

47. (New) A method for designing a bit, comprising:

determining radial forces acting on a selected drill bit during a simulated drilling in selected earth formation;

graphically displaying the radial forces determined during the simulation;

and

adjusting at least one parameter of the drill bit based on the graphical display of the radial forces.

48. (New) A method for selecting a bit design, comprising:

simulating a first bit design drilling in earth formation;
obtaining a first set of radial forces determined from the simulating of the
first bit design;
simulating second bit design drilling in earth formation;
obtaining a second set of radial forces determined from the simulating of
the second bit design;
evaluating the first set of radial forces and the second set of radial forces
based on a selected criterion; and
selecting a preferred bit design based on the evaluating